

REMARKS

Claims 1-25 were pending in the above-identified application when last examined and are amended as indicated above. The claim amendments clarify the claim language and are not intended to limit the scope of the claims, unless the claim language is expressly quoted in the following remarks to distinguish over the art cited.

Claims 21-25 were rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In particular, claims 21-25 were drawn to data structures. In response, claims 21-25 are amended to recite “electronically readable media containing an audio data structure.” Since electronically readable media is statutory subject matter, Applicant request reconsideration and withdrawal of the rejection under 35 U.S.C. § 101.

Claims 1-4, 9-12, 21 and 25 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 5,828,994 (Covell). Claim 2 is canceled. Applicant respectfully traverses the rejection of claims 1, 3, 4, 9-12, 21 and 25.

Independent claim 1 distinguishes over Covell by reciting “preprocessing audio data that includes a sequence of input frames to determine parameters indicating intermediate results in a process for time scaling of respective frames of the audio data, wherein the preprocessing is performed before commencement of a real-time time scaling of the audio data; ... and having the device use the parameters in the real-time time scaling of the audio data to generate time-scaled audio, wherein using the parameters in the real-time time scaling requires less processing power than would time scaling of the audio data without using the parameters.”

Covell is directed to time scaling of audio data using non-uniform time scale factor to make the time scaled audio data more intelligible to the listener. (See the Abstract of Covell.) To determine the appropriate time scale factor for each frame of speech, relative stress and relative speaking rates are computed for individual frames, and the stress and speaking rate are combined to calculate an “audio tension” for each frame. Covell then chooses a time scale for each frame based on the average or nominal time scale factor for the audio and on the audio tension for the frame. Covell fails to disclose or suggest that use of the parameters, e.g., the audio tension values, reduces the processing power required for time scaling.

In regard to the audio tension reducing the required processing power, the Office

Action in the second paragraph of page 4 stated, "The audio tension value is used to adjust the compression rate, which is then applied to the time scale modifier. The tension is related to the voicing and as such stressed sounds are compressed less than pauses, therefore in a SOLA time scaling device there would be less overlap-add operations for a lower compression rate." However, Covell teaches non-linear time scaling that does not change the nominal time scale factor. Accordingly, even if less processing power is required for a single frame, Covell does not suggest that the parameters reduce processing power required for time scaling audio data including a sequence of frames. Further, it would not have been obvious to employ the process of Covell for a single frame because the non-linear nature of the time scaling process requires multiple frames which may be processed with different time scale factors that average out to the nominal value.

Claim 1 is thus patentable over Covell.

Claims 3, 4, and 9-12 depend from claim 1 and are patentable over Covell for at least the same reasons that claim 1 is patentable over Covell.

Independent claim 21 distinguishes over Covell at least by reciting, "a plurality of frames respectively corresponding to sequential sections of audio ...; and one or more parameters for each frame, the parameters providing information that is derived from the samples and indicates an intermediate result of a time scaling process, wherein determination of the intermediate result from the parameters reduces an amount of processing power needed for time scaling the audio data." Covell as described above fails to disclose or suggest parameters that reduce the processing power required for time scaling. Accordingly, claim 21 is patentable over Covell.

Claim 25 depends from claim 21 and is patentable over Covell for at least the same reasons that claim 21 is patentable over Covell.

For the above reasons, Applicant requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 102.

Claims 17, 18, and 20 were rejected under 35 U.S.C. § 102(b) as anticipated by Roucos et al. "High Quality Time-Scale Modification for Speech," Acoustics, Speech and Signal Processing (1985), vol. 10, pp. 493-496, hereinafter Roucos. Applicant respectfully traverses the rejection.

Claim 17 distinguishes over Roucos at least by reciting, "preprocessing audio data to determine one or more parameters indicating a relation between time scales and offsets of a

frame of the audio data relative to preceding audio data.”

Roucos discloses time scaling processes including SOLA and discloses determining offsets for an overlap-and-add process. However, claim 17 recites, “parameters indicating a relation between time scales and offsets.” Roucos does not need (and is silent regarding) a relation between time scales and offsets. In particular, determining an offset for a single time scale (as Roucos does) does not suggest use of parameters indicating a relation between time scales (plural) and offsets (plural). In accordance with an aspect of the current invention, portions of a time scaling process can be performed ahead of time or by a separate system so that the device performing real-time scaling is not over burdened with processing. Parameters indicating a relation between offsets and time scales can be used to identify the correct offset for a current time scale without the need for a time consuming search for a best match block. This reduces processing power required for real-time time scaling even when a user can select or change the time scale factor. Roucos fails to suggest such a process. Accordingly, claim 17 is patentable over Roucos.

Claims 18 and 20 depend from claim 17 and are patentable over Roucos for at least the same reasons that claim 17 is patentable over Roucos.

For the above reasons, Applicant requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 102.

Claims 5 and 8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Covell in view of U.S. Pat. No. 5,920,840 (Satyamurti). Applicant respectfully traverses the rejection.

Claims 5 and 8 depend from claim 1, which is patentable over Covell for at least the reasons set forth above. In particular, Covell fails to disclose or suggest preprocessing audio data to determine parameters that reduce the processing power required for time scaling audio data. The Examiner is citing Satyamurti for disclosing data transmission over a network. However, such teaching does not provide the elements of claim 1 that are missing from Covell. Accordingly, claim 1 and claims 5 and 8 are patentable over the combination of Covell and Satyamurti.

Claim 5 further distinguishes over Covell and Satyamurti by reciting, “transmitting the audio data and the parameters via a network to the device.” The combination of Covell and Satyamurti fails to suggest transmitting both audio data and parameters over a network. The Examiner in the second paragraph of page 8 addressed this issue by stating. “It would have been obvious ... to modify the system of Covell to use the transmission teachings taught by

Satyamurti to transmit both the audio data and the parameters to the device because this would allow the preprocessor to be located remotely from the time scaling device hence preventing any one processor from becoming overloaded.” However, Applicant can find no indication or suggestion in the combination of Covell and Satyamurti of either remote use of a preprocessor or any particular concern for a processor being overloaded. As noted above, Covell is directed to performing additional calculations (e.g., of audio tension) for a non-linear process that makes time scaled audio more intelligible. Covell is not directed to reducing processing at any processor. Further, Satyamurti discloses transmission over a network because it may be convenient for a call receiver (e.g., 112 in Fig. 1) to be remote from an input device 114, not because of a lack of processing power at the remote device. Accordingly, the combination of Covell and Satyamurti would not have led one of skill in the art to a method for reducing processing power or to make the modification that the Examiner now suggests.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 103.

Claims 6, 7, and 22-24 were rejected under 35 U.S.C. § 103(a) as unpatentable over Covell in view of Roucos. Applicant respectfully traverses the rejection.

Claims 6 and 7 depend from claim 1 which distinguishes over the combination of Covell and Roucos at least by reciting, “preprocessing audio data ... to determine parameters indicating intermediate results in a process for time scaling of respective frames of the audio data, wherein the preprocessing is performed before commencement of a real-time time scaling of the audio data; ... and having the device use the parameters in the real-time time scaling ..., wherein using the parameters in the real-time time scaling requires less processing power than would time scaling of the audio data without using the parameters.” The combination of Covell and Roucos fails to disclose preprocessing to reduce required processing power during a real-time time scaling process because neither reference discloses or suggest reducing the processing burden of real-time time scaling.

Claim 7 further distinguishes over the combination of Covell and Roucos by reciting, “the parameters comprise a plurality of offsets for each input frame, the plurality of offsets for each input frame corresponding to different time scales.” Covell and Roucos whether considered separately or in combination fail to disclose determining parameters including a plurality of offsets for each input frame. Instead, each of Covell and Roucos only teach

determining a single offset per frame because only one is required for time scaling by a particular scale factor, whether the scale factor is fixed or varies from frame to frame.

Claims 22-24 depend from claim 21 which is patentable over Covell and Roucos at least for reciting, an "audio data structure comprises: a plurality of frames ...; and one or more parameters for each frame, the parameters providing information that is derived from the samples and indicates an intermediate result of a time scaling process, wherein determination of the intermediate result from the parameters reduces an amount of processing power needed for time scaling the audio data." The combination of Covell and Roucos fail to teach or suggest such a data structure. In particular, Covell discloses determining audio tension, but the audio tension provides another layer of calculation in a time scaling process and as described above does not reduce the processing power required during real-time time scaling. Roucos describes calculating offsets as needed during a time scaling process but does not suggest combining the offsets with audio data into a data structure. The combination of Covell and Roucos further fails to suggest including offsets or other parameters that reduce required processing power in the same data structure as audio data because there is no suggestion in the combination of Covell and Roucos to replace audio tension with offsets or other similar parameters that can be determined on the fly during the time scaling process.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 103.

Claims 13-15 were rejected under 35 U.S.C. § 103(a) as unpatentable over Covell in view of Applicant's admitted prior art. Applicant respectfully traverses the rejection.

Claims 13-15 depend from claim 1, which is patentable over Covell for at least the reasons set forth above. In particular, Covell fails to disclose or suggest preprocessing audio data to determine parameters that reduce the processing power required for time scaling audio data. The Examiner cites Applicant's admitted prior art for disclosing retrieving audio data from a voice mail system and use of time scaling in network systems. However, such teaching does not suggest the features of claim 1 that are missing from Covell. Accordingly, claim 1 and claims 13-15 are patentable over Covell in view of Applicant's admitted prior art.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 103.

Claim 16 was rejected under 35 U.S.C. § 103(a) as unpatentable over Covell in view

of Satyamurti and Applicant's admitted prior art. Applicant respectfully traverses the rejection.

Claim 16 depends from claim 1, which is patentable over the combination of Covell and Satyamurti for at least the reasons set forth above. In particular, the combination of Covell and Satyamurti fails to disclose or suggest preprocessing audio data to determine parameters that reduce the processing power required for time scaling audio data. The Examiner cites Applicant's admitted prior art for disclosing use of time scaling in network systems. However, such teaching does not suggest the features of claim 1 that are missing from Covell. Accordingly, claim 1 and claim 16 are patentable over Covell in view of Satyamurti and Applicant's admitted prior art.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 103.

Claim 19 was objected to but indicated allowable if amended to independent form including the limitations of the base claim and any intervening claims. Claim 19 remains dependent from claim 17, which is patentable for the reasons given above. Accordingly, Applicant requests reconsideration and withdrawal of the objection to claim 19.

New claim 26 depends from claim 21 and is patentable for at least the same reasons that claim 21 is patentable.

In summary, claims 1-25 were pending in the application. This response cancels claim 2, amends claims 1, 6, 9, and 21-25, and adds claim 26. For the above reasons, Applicant respectfully requests allowance of the application including claims 1 and 3-26. Please contact the undersigned attorney at (408) 927-6700 if there are any questions concerning the application or this document.

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